

Remarks

Reconsideration of this Application is respectfully requested.

The specification has been amended to update the status of several related applications. Upon entry of the foregoing amendment, claims 42-43 and 48-50 are pending in the application, with 42 and 48 being the independent claims. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Information Disclosure Statement

Applicants note that references 45, 46, and 59 (JP Nos.: 421650 published 12/12/90, 470746 published 6/23/96, and 6-273,445 published 9/30/94) were not initialed by the Examiner on the Information Disclosure Statement filed June 8, 2001, and considered August 5, 2002. Those references, along with English language abstracts, are being re-submitted for consideration by the Examiner. If the Examiner again refuses to consider the references, Applicant respectfully requests the Examiner provide an explanation for not considering the references.

Rejections under 35 U.S.C. § 102 and 103

Claims 42, 43, and 48-50 were rejected under 35 U.S.C. § 102(a and d) as being anticipated by WO Application No. 95/14314 to Khandros et al ("Khandros"). Claims 42, 43, and 48-50 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Khandros. Claims 42, 43, and 48-50 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,513,430 to Yanof et al ("Yanof").

In regards to the 102(a) and 103(a) rejections using Khandros, Examiner is referred to pages 2 and 3 of the instant specification that specify the instant application is a continuation-in-part of PCT/US94/13373, which is the Khandros reference. Thus, to the extent that reference is being used to reject the claims, that reference is unavailable as a proper reference against the

claims of the pending application. In regards to the inventorship question posed by the Examiner, under 35 U.S.C. § 116 inventorship is determined based on the claims and not the specification. Thus, if the claims are different, even with a similar specification, the inventorship can be different. Thus, Applicants respectfully request the Examiner reconsider and withdraw these rejections.

In regards to the 102(d) rejection under Khandros, 35 U.S.C. § 102(d) states

the invention was first **patented** or caused to be **patented**, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States. (Emphases added).

The Khandros reference is a published PCT application, not a published foreign patent. Thus, 102(d) does not apply in this situation. Thus, Applicants respectfully request the Examiner reconsider and withdraw this rejection.

In regards to the 103(a) rejection using Yanof, Yanof 's effective priority date is August 19, 1994, which is subsequent to the instant applications effective priority date of November 16, 1993 based on the instant application's claim of priority to the Khandros reference. Thus, the Yanof reference is not available as a proper reference against the claims of the pending application. However, even if Yanof were available, the reference fails to disclose mounting fabricated spring contact members before removing a sacrificial substrate, as admitted by the Examiner. There is no motivation in the Yanof reference to depart from its teaching of merely fabricating contacts on a substrate. Thus, Applicants respectfully request the Examiner reconsider and withdraw this rejection.

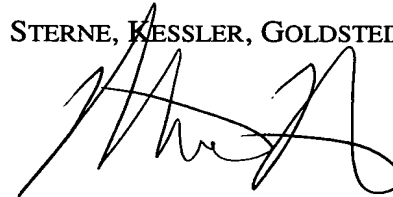
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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Version with markings to show changes made

The title has been changed to the following:

Method for Mounting a Plurality of Spring Contact Elements

Pending page 2 has been replaced with the following:

CROSS-REFERENCE TO RELATED APPLICATIONS

This patent application is a continuation-in-part of commonly-owned, copending U.S. Patent Application No. 60/034,053 filed 31 Dec 96, which is incorporated by reference herein. This patent application is also a continuation-in-part of commonly-owned, copending U.S. Patent Application No. 08/452,255 (hereinafter "PARENT CASE") filed 26 May 95, now U.S. Patent No. 6,336,269, and its counterpart/ PCT patent application number PCT/US95/14909 filed 13 NOV 95, both of which are continuations-in-part of commonly-owned, copending U.S. Patent Application No. 08/340,144 filed 15 Nov 94, now U.S. Patent No. 5,917,707, and its counterpart PCT patent application number PCT/US94/13373 filed 16 Nov 94, now WO Published Application No. 95/14314, both of which are continuations-in-part of commonly-owned, copending U.S. Patent Application No. 08/152,812 filed 16 Nov 93 (now USP 5,476,211, 19 Dec 95), all of which are incorporated by reference herein.

This patent application is also a continuation-in-part of the following commonly-owned, copending U.S. Patent Application Nos.:

08/526,246 filed 21 SEP 95, now abandoned, (PCT/US95/14843, 13 NOV 95);

08/533,584 filed 18 OCT 95, now U.S. Patent No. 5,772,451, (PCT/US95/14842, 13 NOV 95);

08/554,902 filed 09 NOV 95, now U.S. Patent No. 5,974,662, (PCT/US95/14844, 13 NOV 95);

08/558,332 filed 15 NOV 95, now U.S. Patent No. 5,829,128, (PCT/US95/14885, 15 NOV 95);

08/602,179 filed 15 FEB 96, now abandoned, (PCT/US96/08328, 28 MAY 96);

60/012,027 filed 21 FEB 96 (PCT/US96/08117, 24 MAY 96);

60/005,189 filed 17 MAY 96 (PCT/US96/08107, 24 MAY 96); and

60/024,555 filed 26 Aug 96,

all of which (other than the provisional patent applications) are continuations-in-part of the aforementioned PARENT CASE, and all of which are incorporated by reference herein.

Pending page 3, line 1 to page 4, line 30 has been replaced with the following:

Commonly-owned U.S. Patent Application No. 08/152,812 filed 16 Nov 93 [underling deleted from previous part] (now USP 4,576,211, issued 19 Dec 95), and its counterpart commonly-owned copending "divisional" U.S. Patent Applications Nos. 08/457,479 filed 01 Jun 95 [underlining from original deleted from previous part] ([status: pending] now U.S. Patent No. 6,049,976) and 08/570,230 filed 11 Dec 95 [underlining from original deleted from previous part] ([status: pending] now U.S. Patent No. 5,852,871), all by KHANDROS, disclose methods for making resilient interconnection elements for microelectronics applications involving mounting an end of a flexible elongate core element (e.g., wire "stem" or "skeleton") to a terminal on an electronic component coating the flexible core element and adjacent surface of the terminal with a "shell" of one or more materials having a predetermined combination of thickness, yield strength and elastic modulus to ensure predetermined force-to-deflection characteristics of the resulting spring contacts. Exemplary materials for the core element include gold. Exemplary materials for the coating include nickel and its alloys. The resulting spring contact element is suitably used to effect pressure, or demountable, connections between two or more electronic components, including semiconductor devices.

Commonly-owned, [copending U.S. Patent Application No. 08/340,144 filed 15 Nov 94] U.S. Patent No. 5,917,707 and its corresponding PCT Patent Application No. PCT/US94/13373 filed 16 Nov 94 (WO95/14314, -published 26 May 95) [underlining from original deleted from previous part], both by KHANDROS and MATHIEU, disclose a number of applications for the aforementioned spring contact element, and also disclosed techniques for fabricating contact pads at the ends of the spring contact elements. For example, in Figure 14 thereof, a plurality of negative projections or holes, which may be in the form of inverted pyramids ending in apexes, are formed in the surface of a sacrificial layer (substrate) . These holes are then filled with a

contact structure comprising layers of material such as gold or rhodium and nickel. A flexible elongate element is mounted to the resulting contact structure and can be overcoated in the manner described hereinabove. In a final step, the sacrificial substrate is removed. The resulting spring contact has a contact pad having controlled geometry (e.g., sharp points) at its free end.

Commonly-owned, copending U.S. Patent Application No. 08/452,255 filed 26 May 95 and, now U.S. Patent No. 6,336,269, its corresponding PCT Patent Application No. PCT/US95/14909 filed 13 Nov 9 (WO96/17278, -published 06 Jun 96), both by ELDRIDGE, GRUBE, KHANDROS and MATHIEU, disclose additional techniques and metallurgies for fabricating contact tip structures on sacrificial substrates, as well as techniques for transferring a plurality of spring contact elements mounted thereto, en masse, to terminals of an electronic component (see, e.g., Figures 11A-11F and 12A-12C therein).

Pending paragraph on page 7, lines 20-28, has been replaced with the following:

An exemplary application for the spring contact elements of the present invention is as probe elements used to effect pressure connections between a substrate and a device-under-test (DUT), in which case the spring contact elements are suitably mounted to a space transformer component of a probe card assembly, such as is described in the aforementioned **[08/554,902] U.S. Patent No. 5,974,662** and **PCT/US95/14844**. Alternatively, the spring contact elements are mounted to and extend from an active electronic component such as an application specific integrated circuit (ASIC).

Pending paragraph on page 14, lines 2-16, has been replaced with the following:

Commonly-owned, [copending U.S. Patent Application No. 08/554,902 filed 09 Nov 95] U.S. Patent No. 5,974,662 and its corresponding PCT Patent Application No. PCT/US95/14844 filed 13 Nov 95 (WO96/15458, -published 23 May 96) [underlining from original deleted from previous part], both by ELDRIDGE, GRUBE, KHANDROS and MATHIEU, disclose a probe card assembly which includes elongate resilient (spring) contact elements mounted to a "space transformer" component. As used herein, a space transformer is a multilayer interconnection substrate having terminals disposed at a first pitch on a one surface thereof and having

corresponding terminals disposed at a second pitch on an opposite surface thereof, and is used to effect "pitch-spreading" from the first pitch to the second pitch. In use, the free ends (tips) of the elongate spring contact elements make pressure connections with corresponding terminals on an electronic component being probed (e.g., tested).